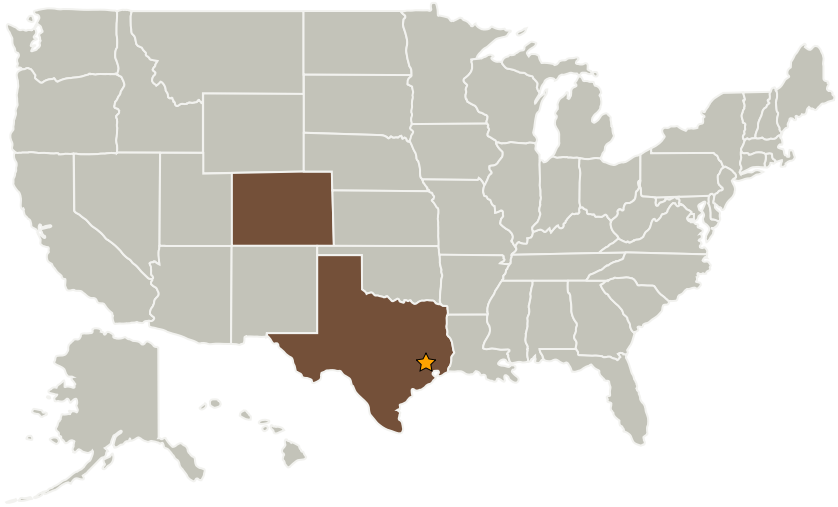
Simple, Micro-Miniature Total Organic Carbon Analyzer, Phase I

Completed Technology Project (2007 - 2007)

Project Introduction

Development of a simple method for on-orbit or advanced mission Total Organic Carbon (TOC) monitoring has been a goal for many years. This proposal seeks to develop a method that is, above all else, simple, inexpensive, and maintenance-free. Previous programs to develop flight hardware, including CHeCS, PCWQM, and previous SBIR-funded efforts, failed to produce workable hardware and were relatively complex and expensive. Since the product water in a closed life support system will not likely vary in characteristics as much as terrestrial water and wastewater samples for which commercial TOC instrumentation is designed to analyze, adaptation of the complex commercial methods for spacecraft application should not be required. We therefore propose to fabricate a simple, low-volume, flow-through device that is based on a micro-reactor to convert organics to organic acids, followed by liquid-phase detection of the acids. Innovative detection methods that do not require frequent calibration are proposed. Phase I will consist of prototype fabrication followed by feasibility tests to quantitatively assess reactor performance and detector sensitivity and precision. Phase II will result in high-fidelity instrumentation that is suitable for flight qualifiication.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Environmental and Life Support Technology, Inc.	Supporting Organization	Industry	Parker, Colorado

Primary U.S. Work Locations	
Colorado	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.2 Mission Infrastructure, Sustainability, and Supportability
    - TX07.2.1 Logistics Management